

4 January 1960

Engineering Report: B-1-60

Subject: General - KLINT

Specific - System VI Changes and Modifications.

I. INTRODUCTION:

The purpose of this report is to describe certain corrections which involved modification of System VI, performed over the last six month period in an attempt to have a workable system. The changes made are principally wiring changes with some mechanical changes. In general the results of the changes appear excellent.

II. DISCUSSION:

Careful analysis and measurements of System VI indicate the basic faults of the system are contained in the cabling and junction box. Bench interconnection and operation shows excellent results; however, upon installation in the aircraft, erratic results are observed and the cause is not seen until the wiring is studied. The following discussion will cover in turn, 1) System VI cabling Harness, 2) System VI Junction Box, and 3) Mechanical Construction.

(1) System VI Cabling Harness:

A print of the System VI intercabling harness is attached to this report. All changes made from the original wiring are indicated in red. All errors in the drawing are shown corrected in blue. (A copy of the diagram has been forwarded to [redacted] at Det. C.) The cabling, as originally supplied, does not utilize shielded cables as they are

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intended, nor is the best configuration applied. Unnecessary wires were deleted and tied back. (These will serve as spare wires for any future need). New wiring was installed using good engineering practices, forethought, and common sense.

The changes involved replacement of the cable plugs at the junction box and the associated equipment. New plugs were procured and the cable rebuilt. Tests made on the ground and in flight indicate the rewiring was worth while. The junction box was also corrected.

(2) Junction Box:

Construction of the junction box was poor. 40 line fuses were originally installed inside the box, and they were later moved to external fuse holders. The two new boxes received in the two modified aircraft have the fuse holders mounted externally.

The corrections performed on the junction box were again an application of common sense wiring techniques. Point to point wiring was used when possible, and the relay was deleted since it served no functional value, yet it could cause a malfunction. The modified junction box has less wiring, a smaller terminal board, etc. yet performs the same functions and is interchangeable with the original unit. Ground connections, commons, and neutrals were NOT tied to one central point within the box as previously done, but were carried to their respective terminations. Power leads and signal lead were shielded.

A copy of the wiring diagram of the present junction box is attached to the System VI Intercabling Schematic. Comparison between the original and the rewired model should be noted. In actuality, the original box is not wired as shown in the print.

(3) Mechanical Construction:

The major change in mechanical construction was in the S-Band nose configuration. The original System VI S-Band configuration called for a large awkward bracket to which were bolted the antennas, coax relay, etc. Installation was extremely difficult. During preflight, substitution of any parts was nearly impossible without complete disassembly of the nose configuration. It is also required that all components be kept off ground.

To alleviate the foregoing, the antennas were mounted with System I Bow-Tie Antenna brackets provided by the aircraft maintenance section. Using System I brackets for the antennas provided room on the nose platform to install a Barrymount for a "Half ATR" rack similar to those used with the HRS and Rambo amplifiers. The Information Amplifier, coax relay, detector, and bandpass filter were then mounted on a plate cut to fit and be easily attached to the Barrymount by use of the two wing nuts. The nose wiring was attached. Several of these S-Band trays have been fabricated to cover any requirement made by headquarters. For example, one tray is built complete with a 2-4 kmc. filter; another is built with a 1-8 kmc. filter; etc. The unit is functional and versatile. The "Special" P & S in the nose section used with System VII is built on one of these trays using old System I interconnection cables. Information concerning the "Special P & S" nose configuration will be sent in a separate report. Note should be made that the beam switch used in this configuration switches R.F.; whereas, previously it switched the detected signal. This same switch has been used in System IV without problem; therefore the savings in weight and space seemed practical.

III. RESULTS:

The rewired and modified System VI as just described has been in use at Detachment B for several months. It was first tested in aircraft 367 with excellent results, characteristics of which are summarized as follows:

- a. Preflight time has decreased from 8 to 12 man-hours to approximately 2 man-hours.
- b. Improvement of P-Band reception due to removal of 400 cycle interference.
- c. No System III interference.
- d. Ease of component or configuration change in the nose section.
- e. Overall operation of the complete configuration is improved.

IV. CONCLUSIONS:

Based on the excellent results of the change in cabling made for aircraft 367, two more sets, including the junction box have been modified at this station. It was noted that the same familiar difficulties were observed on aircraft 358 which arrived with another System VI and utilizing the original type cabling. It is anticipated that all System VI cabling will be replaced at the earliest time.

In the event that more System VI configurations might be purchased it is suggested that several changes be called for. Attached to this report is a rough draft of a "Suggested System VI" configuration which has simplified wiring; a separate power on/off control which eliminates the present poor practice of deriving power through camera equipment; indicating lights which confirm system operation to the pilot; more versatility in that V & S Bands can be flown alone without using the recorders (in the event a System VI Hatch cannot be used); elimination

of pendant plugs which are confusing and non-functional; etc. At best however, System VI will always be difficult to preflight, etc. since it is built into the various sections of the plane at widely separated locations. This condition could be eliminated by a "packaging" of the system so that it could be preflighted in the shop, in a manner similar to that used on Systems III, IV, or VII.

However, continued use of System VI as a reworked-rewired configuration as described in this report will provide good intercept information. Noise levels, tangential sensitivities, etc. are the same in the aircraft as in the shop.

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Communications Team Engineer